

In the Claims

1. (currently amended) A communications multi-service network comprising comprising: a plurality of nodes interconnected via a plurality of quality of service capable tunnels and incorporating a frame-mode MPLS architecture whereby IP services are run directly over a frame-based core part of said multi-service network and legacy services are run over ATM adaptations and emulated ATM services on said core part of the network, the multi-service network further comprising one or more virtual switches for switching data traffic, each virtual switch comprising managed switching resources from a number of said interconnected nodes.

2. (currently amended) A frame-mode switching communications network comprising comprising: a plurality of core nodes establishing a multi-service transport network; a plurality of service nodes each coupled to a said core node to provide access to the transport network; and a network management system arranged to define and manage one or more virtual public/private networks within said communications network, wherein groups of said core nodes are configured as abstract nodes within which abstract nodes any available path may can be selected to achieve a requested connection, wherein an end to end label switched paths are is established via the management system by specifying a series number of abstract nodes between two specified service nodes.

3. (currently amended) A communications network as claimed in claim 2, wherein each said end to end path is specified by identifying first and second ~~real~~ service nodes and one or more abstract nodes therebetween.

4. (currently amended) A communications network as claimed in claim 3, wherein a said virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths.

5. (currently amended) A communications network as claimed in claim 4, wherein each said abstract node is defined by an IP address prefix, and all core nodes which include that prefix in their IP address are part of that abstract node.

6. (currently amended) A communications network as claimed in claim 5, and incorporating a super-ordinate management function arranged to control creation, modification and deletion of virtual switches.

7. (currently Amended) A communications network as claimed in claim 6, wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realize those ~~VPNs~~ VPNs.

8. (currently amended) A communications network as claimed in claim 7, and incorporating a sub-ordinate management function arranged to provide virtual switch management.

9. (currently amended) A communications network as claimed in claim 8, wherein a sub-network manager is responsible for constructing an abstract node information model representation of the network which it passes to a super-ordinate manager.

10. (currently amended) A method of operating a communications multi-service network ~~comprising comprising: interconnecting~~ a plurality of nodes ~~interconnected~~ via a plurality of quality of service capable tunnels such that said nodes incorporate a frame-mode MPLS architecture, wherein : using ATM is used for low or medium capacity access and core transport of legacy services on a frame based core part of said multi-service network; and wherein using frame mode is used for corporate user access to corporate users and for other core transport on said frame based core part of said multi-service network; the method further comprising switching data traffic over using one or more virtual switches to switch data traffic. each virtual switch comprising managed switching resources from a number of said interconnected nodes.

11. (currently amended) A method of operating a frame-mode switching communications multi-service network comprising a plurality of core nodes establishing a multi-service transport network, and including a plurality of service nodes each coupled to a said core node whereby access to the transport is provided, and having a network management system arranged to define and manage one or more virtual public/private networks within said communications network, the method ~~comprising comprising:~~

configuring groups of said core nodes as abstract nodes within which any available path may can be selected to achieve a requested connection, and wherein an end to end label switched path are is established via the management system by specifying a series number of abstract nodes between two specified service nodes.

12. (currently amended) A method as claimed in claim 11, wherein each said end to end path is specified by identifying first and second real nodes and one or more abstract nodes therebetween.

13. (currently amended) A method as claimed in claim 12, wherein a said virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths.

14. (currently amended) A method as claimed in claim 13, wherein each said abstract node is defined by an IP address prefix, and all core nodes which include that prefix in their IP address are part of that abstract node.

15. (currently amended) A method as claimed in claim 14, and including creation, modification and deletion of virtual switches via a super-ordinate management function.

16. (original) A method as claimed in claim 15, wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs.

17. (original) A method as claimed in claim 16, wherein ATM is used for low or medium capacity access, and wherein frame-mode is used for access to corporate sites and for core transport.

18. (currently amended) A communications network ~~comprising~~ comprising; a plurality of core nodes establishing a transport network; a plurality of service nodes each coupled to a said core node to provide access to the transport network; and a network management system arranged to define and manage one or more virtual public/private networks within said communications network, wherein groups of said core nodes are configured as abstract

nodes within which ~~abstract nodes~~ any available path may can be selected to achieve a requested connection, and wherein an end to end label switched paths ~~are~~ is established via the management system by specifying a series number of abstract nodes between two specified service nodes;

wherein a said virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths;

wherein each said abstract node is defined by an IP address prefix, and all core nodes which include that prefix in their IP address are part of that abstract node;

the communications network ~~incorporating~~ incorporates a super-ordinate management function arranged to control creation, modification and deletion of virtual switches; and

wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs.

19. (currently amended) A communications network as claimed in claim 18, and incorporating a sub-ordinate management function arranged to provide virtual switch management.

20. (currently amended) A communications network as claimed in claim 19, wherein a sub-network manager is responsible for constructing an abstract node information model representation of the network which it passes to a super-ordinate manager.

21. (currently amended) A method of operating a communications multi-service network comprising a plurality of core nodes establishing a multi-service transport network, and including a plurality of service nodes each coupled to a said core node whereby access to the transport is provided, and having a network management system arranged to define and manage one or more virtual public/private networks within said communications network, the method comprising comprising:

configuring groups of said core nodes as abstract nodes within which any available path may can be selected to achieve a requested connection;

~~and wherein~~ establishing an end to end label switched paths ~~are~~ established via the management system by specifying a series number of abstract nodes between two specified service nodes;

wherein specifying each said path is specified by identifying first and second real service nodes and one or more abstract nodes therebetween;

wherein defining a said virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths;

wherein defining each said abstract node is defined by an IP address prefix, and including all core nodes which include that prefix in their IP address are as part of that abstract node;

the method including creation, modification and deletion of virtual switches via a super-ordinate management function; and

wherein said super-ordinate manager is adapted for defining said virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs.

22. (previously presented) A method as claimed in claim 21, wherein ATM is used for low or medium capacity access, and wherein frame-mode is used for access to corporate sites and for core transport.

23 to 28 (cancelled).